

RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/311,689

DATE: 05/11/2001

TIME: 12:49:09

Input Set : A:\0571.txt

Output Set: N:\CRF3\05112001\I311689.raw

4 <110> APPLICANT: Pioneer Hi-Bred International, Inc.
 8 <120> TITLE OF INVENTION: Proteins With Enhanced Levels of
 9 Essential Amino Acids
 11 <130> FILE REFERENCE: 0571R2
 C--> 13 <140> CURRENT APPLICATION NUMBER: US/09/311,689
 C--> 13 <141> CURRENT FILING DATE: 1999-05-13
 13 <150> PRIOR APPLICATION NUMBER: 08/740,682
 14 <151> PRIOR FILING DATE: 1996-11-01
 16 <150> PRIOR APPLICATION NUMBER: PCT/US97/20441
 17 <151> PRIOR FILING DATE: 1997-10-31
 19 <160> NUMBER OF SEQ ID NOS: 32
 21 <170> SOFTWARE: FastSEQ for Windows Version 3.0
 23 <210> SEQ ID NO: 1
 24 <211> LENGTH: 249
 25 <212> TYPE: DNA
 26 <213> ORGANISM: Hordeum vulgare
 28 <220> FEATURE:
 29 <221> NAME/KEY: CDS
 30 <222> LOCATION: (1)...(249)
 32 <400> SEQUENCE: 1
 33 agt tca gtg gag aag aag ccg gag gga gtg aac acc ggt gct ggt gac 48
 34 Ser Ser Val Glu Lys Lys Pro Glu Gly Val Asn Thr Gly Ala Gly Asp
 35 1 5 10 15
 37 cgt cac aac ctg aag aca gag tgg cca gag ttg gtg ggg aaa tcg gtg 96
 38 Arg His Asn Leu Lys Thr Glu Trp Pro Glu Leu Val Gly Lys Ser Val
 39 20 25 30
 41 gag gag gcc aag aag gtg att ctg cag gac aag cca gag gcg caa atc 144
 42 Glu Glu Ala Lys Lys Val Ile Leu Gln Asp Lys Pro Glu Ala Gln Ile
 43 35 40 45
 45 ata gtt cta ccg gtg ggg aca att gtg acc atg gaa tat cgg atc gac 192
 46 Ile Val Leu Pro Val Gly Thr Ile Val Thr Met Glu Tyr Arg Ile Asp
 47 50 55 60
 49 cgc gtc cgc ctc ttt gtc gat aaa ctc gac aac att gcc cag gtc ccc 240
 50 Arg Val Arg Leu Phe Val Asp Lys Leu Asp Asn Ile Ala Gln Val Pro
 51 65 70 75 80
 53 agg gtc ggc 249
 54 Arg Val Gly
 58 <210> SEQ ID NO: 2
 59 <211> LENGTH: 83
 60 <212> TYPE: PRT
 61 <213> ORGANISM: Hordeum vulgare
 63 <400> SEQUENCE: 2
 64 Ser Ser Val Glu Lys Lys Pro Glu Gly Val Asn Thr Gly Ala Gly Asp
 65 1 5 10 15
 66 Arg His Asn Leu Lys Thr Glu Trp Pro Glu Leu Val Gly Lys Ser Val
 67 20 25 30
 68 Glu Glu Ala Lys Lys Val Ile Leu Gln Asp Lys Pro Glu Ala Gln Ile

ENTERED

see p. 5

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```

69          35          40          45
70 Ile Val Leu Pro Val Gly Thr Ile Val Thr Met Glu Tyr Arg Ile Asp
71          50          55          60
72 Arg Val Arg Leu Phe Val Asp Lys Leu Asp Asn Ile Ala Gln Val Pro
73 65          70          75          80
74 Arg Val Gly
77 <210> SEQ ID NO: 3
78 <211> LENGTH: 198
79 <212> TYPE: DNA
80 <213> ORGANISM: Hordeum vulgare
82 <220> FEATURE:
83 <221> NAME/KEY: CDS
84 <222> LOCATION: (1)...(198)
86 <400> SEQUENCE: 3
87 atg aac ctg aag aca gag tgg cca gag ttg gtg ggg aaa tcg gtg gag      48
88 Met Asn Leu Lys Thr Glu Trp Pro Glu Leu Val Gly Lys Ser Val Glu
89 1          5          10          15
91 gag gcc aag aag gtg att ctg cag gac aag cca gag gcg caa atc ata      96
92 Glu Ala Lys Lys Val Ile Leu Gln Asp Lys Pro Glu Ala Gln Ile Ile
93          20          25          30
95 gtt cta ccg gtg ggg aca att gtg acc atg gaa tat cgg atc gac cgc      144
96 Val Leu Pro Val Gly Thr Ile Val Thr Met Glu Tyr Arg Ile Asp Arg
97          35          40          45
99 gtc cgc ctc ttt gtc gat aaa ctc gac aac att gcc cag gtc ccc agg      192
100 Val Arg Leu Phe Val Asp Lys Leu Asp Asn Ile Ala Gln Val Pro Arg
101          50          55          60
103 gtc ggc      198
104 Val Gly
105 65
108 <210> SEQ ID NO: 4
109 <211> LENGTH: 66
110 <212> TYPE: PRT
111 <213> ORGANISM: Hordeum vulgare
113 <400> SEQUENCE: 4
114 Met Asn Leu Lys Thr Glu Trp Pro Glu Leu Val Gly Lys Ser Val Glu
115 1          5          10          15
116 Glu Ala Lys Lys Val Ile Leu Gln Asp Lys Pro Glu Ala Gln Ile Ile
117          20          25          30
118 Val Leu Pro Val Gly Thr Ile Val Thr Met Glu Tyr Arg Ile Asp Arg
119          35          40          45
120 Val Arg Leu Phe Val Asp Lys Leu Asp Asn Ile Ala Gln Val Pro Arg
121          50          55          60
122 Val Gly
123 65
125 <210> SEQ ID NO: 5
126 <211> LENGTH: 198
127 <212> TYPE: DNA
128 <213> ORGANISM: Hordeum vulgare
130 <220> FEATURE:

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131 <221> NAME/KEY: CDS
132 <222> LOCATION: (1)...(198)
134 <400> SEQUENCE: 5
135 atg aag ctg aag aca gag tgg ccg gag ttg gtg ggg aaa tcg gtg gag      48
136 Met Lys Leu Lys Thr Glu Trp Pro Glu Leu Val Gly Lys Ser Val Glu
137 1 5 10 15
139 aaa gcc aag aag gtg atc ctg aag gac aag cca gag gcg caa atc ata      96
140 Lys Ala Lys Lys Val Ile Leu Lys Asp Lys Pro Glu Ala Gln Ile Ile
141 20 25 30
143 gtt ctg ccg gtt ggt aca aag gtg acg aag gaa tat aag atc gac cgc      144
144 Val Leu Pro Val Gly Thr Lys Val Thr Lys Glu Tyr Lys Ile Asp Arg
145 35 40 45
147 gtc aag ctc ttt gtg gat aaa aag gac aac atc gcg cag gtc ccc agg      192
148 Val Lys Leu Phe Val Asp Lys Lys Asp Asn Ile Ala Gln Val Pro Arg
149 50 55 60
151 gtc ggc      198
152 Val Gly
153 65
156 <210> SEQ ID NO: 6
157 <211> LENGTH: 66
158 <212> TYPE: PRT
159 <213> ORGANISM: Hordeum vulgare
161 <400> SEQUENCE: 6
162 Met Lys Leu Lys Thr Glu Trp Pro Glu Leu Val Gly Lys Ser Val Glu
163 1 5 10 15
164 Lys Ala Lys Lys Val Ile Leu Lys Asp Lys Pro Glu Ala Gln Ile Ile
165 20 25 30
166 Val Leu Pro Val Gly Thr Lys Val Thr Lys Glu Tyr Lys Ile Asp Arg
167 35 40 45
168 Val Lys Leu Phe Val Asp Lys Lys Asp Asn Ile Ala Gln Val Pro Arg
169 50 55 60
170 Val Gly
171 65
173 <210> SEQ ID NO: 7
174 <211> LENGTH: 198
175 <212> TYPE: DNA
176 <213> ORGANISM: Hordeum vulgare
178 <220> FEATURE:
179 <221> NAME/KEY: CDS
180 <222> LOCATION: (1)...(198)
182 <400> SEQUENCE: 7
183 atg aag ctg aag aca gag tgg ccg gag ttg gtg ggg aaa tcg gtg gag      48
184 Met Lys Leu Lys Thr Glu Trp Pro Glu Leu Val Gly Lys Ser Val Glu
185 1 5 10 15
187 aaa gcc aag aag gtg atc ctg aag gac aag cca gag gcg caa atc ata      96
188 Lys Ala Lys Lys Val Ile Leu Lys Asp Lys Pro Glu Ala Gln Ile Ile
189 20 25 30
191 gtt cta ccg gtt ggt aca aag gtg gcg aag gcc tat aag atc gac aag      144
192 Val Leu Pro Val Gly Thr Lys Val Ala Lys Ala Tyr Lys Ile Asp Lys

```

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```

193          35          40          45
195 gtc aag ctt ttt gtg gat aaa aag gac aac atc gcg cag gtc ccc agg      192
196 Val Lys Leu Phe Val Asp Lys Lys Asp Asn Ile Ala Gln Val Pro Arg
197          50          55          60
199 gtc ggc      198
200 Val Gly
201 65
204 <210> SEQ ID NO: 8
205 <211> LENGTH: 66
206 <212> TYPE: PRT
207 <213> ORGANISM: Hordeum vulgare
209 <400> SEQUENCE: 8
210 Met Lys Leu Lys Thr Glu Trp Pro Glu Leu Val Gly Lys Ser Val Glu
211 1          5          10          15
212 Lys Ala Lys Lys Val Ile Leu Lys Asp Lys Pro Glu Ala Gln Ile Ile
213          20          25          30
214 Val Leu Pro Val Gly Thr Lys Val Ala Lys Ala Tyr Lys Ile Asp Lys
215          35          40          45
216 Val Lys Leu Phe Val Asp Lys Lys Asp Asn Ile Ala Gln Val Pro Arg
217          50          55          60
218 Val Gly
219 65
221 <210> SEQ ID NO: 9
222 <211> LENGTH: 198
223 <212> TYPE: DNA
224 <213> ORGANISM: Hordeum vulgare
226 <220> FEATURE:
227 <221> NAME/KEY: CDS
228 <222> LOCATION: (1)...(198)
230 <400> SEQUENCE: 9
231 atg aag ctg aag aca gag tgg ccg gag ttg gtg ggg aaa tcg gtg gag      48
232 Met Lys Leu Lys Thr Glu Trp Pro Glu Leu Val Gly Lys Ser Val Glu
233 1          5          10          15
235 aaa gcc aag aag gtg atc ctg aag gac aag cca gag gcg caa atc ata      96
236 Lys Ala Lys Lys Val Ile Leu Lys Asp Lys Pro Glu Ala Gln Ile Ile
237          20          25          30
239 gtt cta ccg gtt ggt aca aag gtg ggt aag cat tat aag atc gac aag      144
240 Val Leu Pro Val Gly Thr Lys Val Gly Lys His Tyr Lys Ile Asp Lys
241          35          40          45
243 gtc aag ctt ttt gtg gat aaa aag gac aac atc gcg cag gtc ccc agg      192
244 Val Lys Leu Phe Val Asp Lys Lys Asp Asn Ile Ala Gln Val Pro Arg
245          50          55          60
247 gtc ggc      198
248 Val Gly
249 65
252 <210> SEQ ID NO: 10
253 <211> LENGTH: 66
254 <212> TYPE: PRT
255 <213> ORGANISM: Hordeum vulgare

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```

257 <400> SEQUENCE: 10
258 Met Lys Leu Lys Thr Glu Trp Pro Glu Leu Val Gly Lys Ser Val Glu
259 1 5 10 15
260 Lys Ala Lys Lys Val Ile Leu Lys Asp Lys Pro Glu Ala Gln Ile Ile
261 20 25 30
262 Val Leu Pro Val Gly Thr Lys Val Gly Lys His Tyr Lys Ile Asp Lys
263 35 40 45
264 Val Lys Leu Phe Val Asp Lys Lys Asp Asn Ile Ala Gln Val Pro Arg
265 50 55 60
266 Val Gly
267 65
269 <210> SEQ ID NO: 11
270 <211> LENGTH: 252
271 <212> TYPE: DNA
272 <213> ORGANISM: Hordeum vulgare
274 <220> FEATURE:
275 <221> NAME/KEY: CDS
276 <222> LOCATION: (1)...(252)
278 <400> SEQUENCE: 11
279 atg aag tcg gtg gag aag aaa ccg aag ggt gtg aag aca ggt gcg ggt 48
280 Met Lys Ser Val Glu Lys Lys Pro Lys Gly Val Lys Thr Gly Ala Gly
281 1 5 10 15
283 gac aag cat aag ctg aag aca gag tgg ccg gag ttg gtg ggg aaa tcg 96
284 Asp Lys His Lys Leu Lys Thr Glu Trp Pro Glu Leu Val Gly Lys Ser
285 20 25 30
287 gtg gag aaa gcc aag aag gtg atc ctg aag gac aag cca gag gcg caa 144
288 Val Glu Lys Ala Lys Lys Val Ile Leu Lys Asp Lys Pro Glu Ala Gln
289 35 40 45
291 atc ata gtt cta ccg gtt ggt aca aag gtg ggt aag cat tat aag atc 192
292 Ile Ile Val Leu Pro Val Gly Thr Lys Val Gly Lys His Tyr Lys Ile
293 50 55 60
295 gac aag gtc aag ctt ttt gtg gat aaa aag gac aac atc gcg cag gtc 240
296 Asp Lys Val Lys Leu Phe Val Asp Lys Lys Asp Asn Ile Ala Gln Val
297 65 70 75 80
299 ccc agg gtc ggc 252
300 Pro Arg Val Gly
304 <210> SEQ ID NO: 12
305 <211> LENGTH: 84
306 <212> TYPE: PRT
307 <213> ORGANISM: Hordeum vulgare
309 <400> SEQUENCE: 12
310 Met Lys Ser Val Glu Lys Lys Pro Lys Gly Val Lys Thr Gly Ala Gly
311 1 5 10 15
312 Asp Lys His Lys Leu Lys Thr Glu Trp Pro Glu Leu Val Gly Lys Ser
313 20 25 30
314 Val Glu Lys Ala Lys Lys Val Ile Leu Lys Asp Lys Pro Glu Ala Gln
315 35 40 45
316 Ile Ile Val Leu Pro Val Gly Thr Lys Val Gly Lys His Tyr Lys Ile
317 50 55 60

```

Please Note:

Use of n and/or Xaa have been detected in the Sequence Listing. Please review the Sequence Listing to ensure that a corresponding explanation is presented in the <220> to <223> fields of each sequence which presents at least one n or Xaa.

VERIFICATION SUMMARY

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Input Set : A:\0571.txt

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L:13 M:270 C: Current Application Number differs, Replaced Current Application No

L:13 M:271 C: Current Filing Date differs, Replaced Current Filing Date

L:577 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:23

L:578 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:23

L:680 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:27

L:681 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:27

L:701 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:27

L:704 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:27

L:705 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:27

L:706 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:27

L:719 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:28

L:729 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:28

L:766 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:29

L:767 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:29

L:824 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:31